

EXHIBIT C

Page 1

IN THE UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

ENTROPIC COMMUNICATIONS, LLC,)
Plaintiff,)
vs.) Case No.:
CHARTER COMMUNICATIONS, INC.,)
Defendants.)

VIDEO-RECORDED REMOTE DEPOSITION OF
STEVEN GOLDBERG, Ph.D. EE
Cupertino, California
Tuesday, August 22, 2023; 7:58 a.m.

TAKEN IN BEHALF OF THE PLAINTIFFS

REPORTED BY:

Victoria A. Guerrero, CSR, RDR, RMR, CRR

Job No. 6060655

Pages 1 through 263

1 IN THE UNITED STATES DISTRICT COURT
2 EASTERN DISTRICT OF TEXAS
3 MARSHALL DIVISION

5 ENTROPIC COMMUNICATIONS, LLC,)
6 Plaintiff,)
7) Case No.:
8 vs.) 2:22-cv-00125-JRG
9)
10 CHARTER COMMUNICATIONS, INC.,)
11 Defendants.)
12)

15 BE IT REMEMBERED that, pursuant to Federal
16 Rules of Civil Procedure, the deposition of STEVEN
17 GOLDBERG, Ph.D.EE was taken before Victoria A.
18 Guerrero, California Certified Shorthand Reporter,
19 Registered Diplomate Reporter, Registered Merit
20 Reporter, and Certified Realtime Reporter, on
21 Tuesday, August 22, 2023, commencing at the hour of
22 7:58 a.m., the witness responding to questions by
23 videoconference from Cupertino, California; the
24 questions being propounded and proceedings reported
25 remotely via videoconference.

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22

23

24

25

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1 INDEX TO EXAMINATION

2 WITNESS: STEVEN GOLDBERG, Ph.D. EE

3

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7 By Mr. Shimota	256	7

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1 Tuesday, August 22, 2023; 7:58 a.m.

2 | Cupertino, California

3 | 00000

4 THE VIDEOGRAPHER: Good morning. We're 07:58:32
5 going on the record. The time is 7:58 a.m. and 07:58:33
6 the date is August 22nd, 2023. Please note 07:58:37
7 that this deposition is being conducted 07:58:42
8 virtually. Quality of recording depends on the 07:58:44
9 quality of camera and internet connection of 07:58:47
10 participants. What is seen from the witness 07:58:49
11 and heard is what will be recorded. Audio and 07:58:51
12 video recording will continue to take place 07:58:55
13 unless all parties agree to go off. 07:58:57

23 My name is Sean Grant, videographer, of 07:59:30
24 Veritext. The court reporter is Victoria 07:59:31
25 Guerrero also of Veritext. I'm not related to 07:59:33

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1 any party, nor am I financially interested in 07:59:35
2 the outcome. 07:59:37
3 If there are any objections to proceeding, 07:59:38
4 please state them at the time of your 07:59:39
5 appearance. Counsel and all present, including 07:59:42
6 remotely, will now state their appearances and 07:59:43
7 affiliations for the record beginning with the 07:59:46
8 noticing attorney. 07:59:48
9 MR. SHIMOTA: James Shimota of the law 07:59:52
10 firm K & L Gates appearing on behalf of 07:59:54
11 Entropic Communications LLC, joined as well by 07:59:57
12 my colleague Pat Richey also from the law firm 07:59:59
13 K & L Gates. 08:00:04
14 MR. BENYACAR: David Benyacar of the 08:00:05
15 Arnold & Porter firm for the Charter 08:00:08
16 defendants. 08:00:10
17 THE VIDEOGRAPHER: Thank you. Will the 08:00:11
18 certified court reporter please swear in the 08:00:12
19 witness. 08:00:13
20 ooOoo 08:00:13
21 Whereupon, STEVEN GOLDBERG, Ph.D.EE, having 08:00:13
22 first been sworn by the California 08:00:13
23 Certified Shorthand Reporter, testified 08:00:13
24 under oath as follows: 08:00:13
25 /// 08:00:13

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1 understand that this ability to program the MAC 10:58:32
2 functions to support evolving standards to disclose 10:58:35
3 "the cable modem engine configured to enable 10:58:38
4 upgrades to its software in a manner that is 10:58:42
5 independent of upgrades to the software of the data 10:58:44
6 networking engine." 10:58:47

7 A POSITA would understand this remote 10:58:49
8 programmability functionality to deliver software 10:58:50
9 upgrades could easily be integrated in the DOCSIS 10:58:54
10 interface of Dong. Remote software upgrades were 10:58:58
11 well known to the industry far in advance of the 10:59:02
12 priority date of this patent. 10:59:10

13 Q So I take it the answer to my question, 10:59:12
14 then, is that paragraphs 63 and 64 are the 10:59:13
15 paragraphs in which you offer opinions concerning -- 10:59:15
16 that's what you identify today as where you describe 10:59:17
17 the reasons for the motivation to combine the 10:59:21
18 references? 10:59:23

19 A That wasn't my testimony. I said at least. 10:59:24
20 I'm very sure I said that. 10:59:26

21 Q Okay. What else? I want to find it. 10:59:28

22 A I'm looking. And if I -- 10:59:32

23 Q Good. 10:59:34

24 A Just going to refresh my recollection here. 10:59:35
25 Well, certainly -- I just searched on upgrades. The 11:06:28

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1 relevant -- it seems the relevant -- the majority of 11:06:31
2 my opinion is in -- what did we say? 63 and 64? 11:06:36
3 That was your question? 11:06:45

4 Q No. I want to be clear on this because you 11:06:49
5 spent about 15 minutes reading your report. And 11:06:51
6 you've identified 63 and 64 as where you say 11:06:53
7 motivation to combine is described with respect to 11:06:56
8 Dong and Brooks. 11:06:59

9 And I want to know after that 15 minutes of 11:07:00
10 review if there's anything else? 11:07:03

11 A Well, I would just basically say, you know, 11:07:05
12 a person of ordinary skill-in-the-art, I go through 11:07:07
13 what Dong does. And that's in many sections of this 11:07:10
14 particular -- that's in many paragraphs of this 11:07:14
15 particular section of what Dong is doing with 11:07:17
16 regards to DOCSIS and the, you know, the element 26, 11:07:19
17 I think he calls the MTA. And the MTA is the data 11:07:31
18 networking engine, he calls the other block. Let me 11:07:46
19 see. 11:07:49

20 Q So if you were in front of the Court right 11:08:00
21 now and the Court asked you what paragraphs in which 11:08:01
22 you describe the motivation to combine Dong and 11:08:04
23 Brooks, what would be the specific paragraphs that 11:08:10
24 you would direct the Court to? 11:08:12

25 A 63 and 64. 11:08:14

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1 section. 13:48:20

2 Q Where? In that section, where? What 13:48:23

3 sentence are you referring to? 13:48:27

4 A I'm referring to -- I'm referring to -- I'm 13:48:28

5 referring to limitation 1B, a signal monitor 13:48:52

6 operable to analyze set digitized signal to 13:48:56

7 determine a characteristic of said digitized signal. 13:48:59

8 And I talk in 256, paragraph 257, 258 and 259 and 13:49:03

9 260. 13:49:14

10 I state at the end, A POSITA would readily 13:49:18

11 understand that such functionality would be 13:49:21

12 necessary for the system to operate and that Coyne 13:49:23

13 discloses this limitation. 13:49:25

14 Q Right. 13:49:33

15 A Yeah. I understand that. And you asked 13:49:34

16 me -- I understand. You asked me where do I say a 13:49:36

17 person of ordinary skill in the art would combine 13:49:40

18 Coyne with Narita, that's the open question? 13:49:42

19 Q No. Where would one of skill-in-the-art be 13:49:45

20 motivated, not that they would, but where in your 13:49:48

21 report do you opine that one skilled would be 13:49:51

22 motivated to combine Coyne and Narita? 13:49:54

23 Direct me to the paragraph or sentence. 13:49:58

24 Where is that? 13:49:59

25 A Well, Narita talks about characteristic of 13:50:01

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1 signals, signal strength, desire to unwanted -- 13:50:06
2 desired signal to unwanted signal ratio, the carrier 13:50:11
3 noise ratio. 13:50:15

4 And Narita discloses these values or 13:50:29
5 reported to a controller that determines these 13:50:32
6 characteristics. So Narita is focused on, you know, 13:50:34
7 very much the problem that we're discussing here. 13:50:39

8 So 265, Coyne understanding Narita, but I 13:50:52
9 did not explicitly say a POSITA would look at them 13:50:57
10 together. What I said was they're both focused on 13:51:03
11 the same signal areas. They were focused on the 13:51:06
12 same area of technology. 13:51:13

13 Q Is it fair to say, then, that you don't 13:51:18
14 explicitly say in your report that one of ordinary 13:51:20
15 skill-in-the-art would be motivated to combine Coyne 13:51:23
16 with Narita? 13:51:26

17 A Let me just -- I understand your question. 13:51:27
18 Let me just make sure I was complete in looking at 13:51:29
19 my report. In those paragraphs, 256 through 265, I 13:51:32
20 don't explicitly talk about a motivation to combine 13:53:08
21 Narita and Coyne. 13:53:13

22 Q Right. Not to put too fine a point on it, 13:53:15
23 but you don't discuss anywhere in your report, 13:53:18
24 explicitly, a motivation to combine Coyne and 13:53:20
25 Narita, correct? 13:53:23

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1 A I use Narita in places. So what I'm 13:53:59
2 checking now is -- oh, in claim 2. I just did a 13:54:07
3 quick search of Narita and I didn't see any other 13:56:06
4 places. 13:56:09

5 Q Okay. Thank you. Let's take a look at 13:56:10
6 Coyne now. That's Exhibit 10 in the Exhibit Share. 13:56:14

7 (Exhibit 10, US Patent Application 13:56:29
8 Publication No. US 2007/0286311 A1 (Coyne); 13:56:30
9 CHARTER_ENTROPIC00033947 through 33957, was 13:56:30
10 marked.) 13:56:30

11 THE WITNESS: Yes, I'm there. 13:56:32

12 BY MR. SHIMOTA: 13:56:33

13 Q And would you agree with me, at least in 13:56:33
14 the specific embodiments in the patents, Coyne is 13:56:35
15 discussing a military application? 13:56:40

16 A No, I wouldn't agree. 13:56:45

17 Q You don't agree that there are embodiments 13:56:51
18 in which they're describing the use of the system on 13:56:54
19 a military vehicle, for example? 13:56:57

20 A Oh, if you're asking me are there 13:56:59
21 embodiments? If you would like to point me to those 13:57:02
22 embodiments. If that's the question, that's a 13:57:07
23 different question than I first understood. 13:57:09

24 Q Right. Right. Are there embodiments that 13:57:12
25 are describing the use of the system in Coyne in 13:57:14

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1 was three -- 15:36:21

2 Q 319. And my question is, let's start 15:36:22

3 there, at the time frame you talked about, were 15:36:24

4 there other techniques aside from mixers that could 15:36:28

5 be used for down conversion? 15:36:31

6 A No. I want to point out a couple of 15:36:37

7 things. Zhang has an analog front end which means 15:36:38

8 the boxes to the left -- the box to the left of the 15:36:44

9 analog-to-digital converter. 15:36:48

10 There really weren't many -- I'm really 15:36:52

scratching my head because I worked in this area for 15:36:59

12 decades. And I actually designed block down 15:37:02

converters in multiple jobs as an engineer, as a 15:37:06

14 person of ordinary skill-in-the-art, and especially 15:37:11

15 in satellite systems. 15:37:13

16 A block down converter always used a mixer. 15:37:14

17 If you ask me a more broad question, are there other 15:37:18

techniques that can down-convert signals independent 15:37:22

19 of whether it's analog or digital? That's a very 15:37:26

20 different question 15.37.31

21 But we're talking about something to the 15:37:31

³³ left of the Auto-D converter in Zhang, which means 15.37.34

23 its analog 15 + 37 + 37

Q. **Clay:** In the analog domain, were there 15:37:48

other techniques other than using a mixer to downsize the sample.

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1 convert at the time of the '362 patent? 15:37:46

2 A Well, what I said was -- let me see here. 15:38:48

3 I talk about it paragraph 329 and I reference 15:39:11

4 another piece of art which actually shows the mixers 15:39:14

5 doing the down conversion. It's not the question 15:39:16

6 you asked and I'm going to answer it here. 15:39:20

7 Q Correct. 15:39:23

8 A I guess what I would say, I see my report. 15:40:56

9 And as a person of ordinary skill-in-the-art or one 15:40:58

10 of greater ordinary skill-in-the-art, I say in 391, 15:41:00

11 In my view, however, a POSITA would have understood 15:41:04

12 that a down converter 210, in the architecture 15:41:08

13 taught by Zhang, would be implemented as a mixer, 15:41:11

14 which was well-known. 15:41:14

15 And that "well-known" doesn't even begin 15:41:17

16 to -- it's like I didn't say inherent, I didn't use 15:41:20

17 that word. I said would understand it was 15:41:29

18 well-known. 15:41:30

19 I mean, it's the first thing that comes to 15:41:31

20 mind. When you say block down converter you think 15:41:33

21 of a local loss leader in a mixer. If you were a 15:41:36

22 person of ordinary skill-in-the-art in that time, 15:41:39

23 which I was, and I was for many years, so I stand by 15:41:40

24 my statement. 15:41:46

25 You're asking me -- and I didn't prepare 15:41:47

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1 this for -- because if you look at my opinion, I 15:41:49
2 didn't prepare exhaustively where there's some 15:41:52
3 esoteric down conversion techniques that weren't 15:41:57
4 mixers. I didn't make that statement. And I didn't 15:42:00
5 prepare that for this deposition. 15:42:04

6 But I would strongly state that when you 15:42:07
7 use the term "block down converter," it was 15:42:10
8 strong -- it would be understood as a mixer. And 15:42:14
9 that's what I said. 15:42:22

10 Q I'm sorry if I cut you off. Are you 15:42:23
11 finished? 15:42:24

12 A I just say that's what I say in my report 15:42:25
13 in paragraph 391. And then an example -- I'm sorry. 15:42:27
14 I gave an example of this other art, the US Patent 15:42:31
15 Application Publication 089 by Li discloses a 15:42:42
16 receiver and it shows a mixer. It's very common, it 15:42:48
17 understates it. You know, almost universal except 15:42:53
18 maybe in university labs or something where they do 15:43:00
19 something different. 15:43:03

20 Q Are you done? 15:43:10

21 A I am. 15:43:10

22 Q I just want to be clear. What I understood 15:43:11
23 you to say is in 391 you're not arguing that a -- 15:43:12
24 that the disclosure of a down converter means 15:43:17
25 that -- that it's inherent, then; that there had 15:43:20

1 been a mixer, right? You're not making that 15:43:23
2 argument? 15:43:25

3 A I didn't use the word "inherent" in my 15:43:25
4 report. 15:43:28

5 Q Well, are you making that argument that 15:43:29
6 it's inherent? 15:43:31

7 A If you listen to what I said, I said 15:43:32

8 overwhelmingly. Well-known is -- I said 15:43:35

9 "well-known" in my report and I'm adding now that 15:43:41

10 it's overwhelmingly understood by people of ordinary 15:43:45

11 skill. If you say a block down converter, you're 15:43:49

12 talking about the use of a mixer. 15:43:52

13 Even though I understand that if I do a 15:43:54

14 search on -- if I go to Zhang and I do a 15:44:00

15 search on -- 15:44:06

16 Q Why is that different than inherent, that 15:44:14
17 it's exceedingly well-known? 15:44:16

18 A Well, I understand that -- and we can go to 15:44:24
19 my report. Inherent is a very strong statement that 15:44:25
20 it's inherently there. It's necessarily there. 15:44:28

21 Q You're right. That's a hundred percent 15:44:32
22 correct 15:44:33

23 A Thank you. My attorneys taught me well. I 15:44:34
24 think that's what's in the section. What I'm saying 15:44:41
25 here, and what my report says, a person of ordinary 15:44:43

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1 skill-in-the-art looking at this reference would 15:44:46
2 understand that a mixer would be used. 15:44:49

3 Q Right. But you wouldn't necessarily have 15:44:55
4 to use a mixer. You're just saying it would be 15:44:57
5 exceedingly well-known? 15:44:59

6 A I'm telling you here if you didn't use a 15:45:01
7 mixer, I don't know what you use. Sitting here 15:45:03
8 today, I don't know what else you would use. 15:45:05

9 Q Could you use a multiplier? 15:45:08

10 A A multiplier and a mixer are -- so 15:45:10
11 multipliers -- okay. Great question. And I can 15:45:16
12 give you an answer. 15:45:21

13 A mixer produces a multiplying function. 15:45:24
14 So a mixer does a multiplication. It multiplies the 15:45:29
15 two signals together. Now, it turns out it does 15:45:33
16 other things. But if you want to -- in my mind as a 15:45:39
17 person of ordinary skill-in-the-art, if you said 15:45:42
18 analog multiplier, that gets implemented as a mixer. 15:45:44

19 Q Okay. Could you use a Hall effect sensor? 15:45:49

20 A I didn't come prepared to talk about that. 15:45:58
21 I've heard the term before -- like I said, if you're 15:46:00
22 trying to push me into a corner to say -- and I was 15:46:08
23 very clear about this. 15:46:11

24 I said in the Zhang application with a 15:46:12
25 block down converter for the applications that he's 15:46:15

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1 talking about, it's almost always a mixer. And I 15:46:18
2 said I didn't know what it would be if it wasn't. 15:46:22
3 And if you come up with some esoteric like a Hall 15:46:25
4 effect sensor, I don't ever remember in all the 15:46:29
5 companies I've seen, in all the receivers I've seen 15:46:34
6 over my 50 years have I ever seen that used. 15:46:37

7 Q Could you use an analog circuit to 15:46:42
8 implement a discrete Fourier Transform to perform 15:46:44
9 the down converting function? 15:46:46

10 A Remember, we're in the analog domain. 15:46:50

11 Q Right. Could you use an analog circuit to 15:46:54
12 implement a discrete Fourier function? 15:46:58

13 A Would you use an analog circuit to do 15:47:00
14 a Fourier Transform? 15:47:04

15 Q Correct. Yes. Sorry. I misspoke. 15:47:06
16 (Reporter requests clarification.) 15:47:07

17 THE WITNESS: First of all, I think that's 15:47:16
18 a non sequitur question. Because, could you 15:47:30
19 use one? I don't know in what -- I didn't come 15:47:34
20 prepared to talk about that. 15:47:38

21 I mean, I know exactly what a Fourier 15:47:39
22 Transform is, but I didn't come here today 15:47:41
23 prepared to do engineering on the Zhang 15:47:44
24 circuit. I'm just telling you what I stated in 15:47:47
25 my report and I stand by my report. Let me 15:47:49

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1 just go back here. 15:48:00
2 It was paragraph, which one we said? 15:48:25
3 BY MR. SHIMOTA: 15:48:26
4 Q 391. 15:48:27
5 A I say I note that the specification of 15:48:32
6 Zhang does not use the term "mixer" in connection 15:48:34
7 with its frequency block down converter, such as 15:48:37
8 frequency block down converter 210 depicted in 15:48:40
9 figure 2. 15:48:43
10 In my view, however, a POSITA would have 15:48:44
11 understood that a down converter 210, and I will 15:48:47
12 add, in the content of the Zhang patent, in the 15:48:52
13 architecture taught by Zhang, would be implemented 15:48:55
14 as a mixer, which was a well-known technique for 15:48:57
15 down converting RF signals at the time of Zhang and 15:49:01
16 well before the alleged priority date of the patent. 15:49:04
17 I stand by that statement. 15:49:07
18 Q Right. And I think your testimony just was 15:49:10
19 it would almost always be implemented as a mixer in 15:49:13
20 Zhang, but you're not -- as I understand it, you're 15:49:16
21 not prepared to testify today that it would 15:49:18
22 necessarily always be implemented as a mixer, right? 15:49:22
23 You're just not ready, you don't know this esoteric 15:49:24
24 thing? 15:49:28
25 A I didn't prepare in this report if it was 15:49:29

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1 some other esoteric thing that could do that. And I 15:49:30
2 didn't say that in my report. 15:49:33

3 Q Right. Okay. So you're just -- you're 15:49:35
4 saying it likely would be, but you're not saying it 15:49:35
5 would necessarily have to be a mixer in the 15:49:37
6 architecture of Zhang, correct? 15:49:41

7 A Yeah. I've said it in other places in the 15:49:43
8 report. If I meant inherent necessarily, I would 15:49:46
9 have said it. I didn't say that. 15:49:48

10 Q Gotcha. Fair enough. That's all. Let's 15:49:50
11 go to 392. 15:49:53

12 A Can we take a ten-minute break? 15:49:56

13 Q Sure. 15:49:58

14 A Thank you. 15:49:59

15 THE VIDEOGRAPHER: Going off the record. 15:50:00

16 The time is 3:50 p.m. 15:50:01

17 (Off the record.) 15:50:03

18 THE VIDEOGRAPHER: Back on the record. 15:59:59

19 The time is 4:00 p.m. 15:59:59

20 BY MR. SHIMOTA: 16:00:04

21 Q Welcome back. Can I direct your attention 16:00:04
22 to paragraph 374, please? 16:00:07

23 A May I please add one piece of information 16:00:08
24 to my testimony, please? 16:00:10

25 Q Sure. 16:00:11

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1 A That's correct. Li was brought in as 16:04:38
2 support for the use of a mixer. Just that it's 16:04:40
3 obvious to a person of ordinary skill in the art. I 16:04:44
4 don't think any of my headings in my report -- but 16:04:47
5 I'll double-check that. Let me just -- before I 16:04:52
6 give you, quote/unquote, my final answer. 16:04:55

7 Well, I state that in my opinion claims 11 16:05:33
8 and 12 -- in my paragraph 374 -- are invalid -- 16:05:36
9 claims 11 and 12 of the '362 patent are invalid over 16:05:41
10 US Patent No. -- and I'll shorten it -- '372 Zhang 16:05:47
11 alone, or Zhang in combination with US Patent No. 16:05:52
12 '792 Favrat. 16:05:54

13 It's also my opinion claims 11 and 12 of 16:06:01
14 the '362 are invalid over US Patent '901, Dauphinee. 16:06:03
15 That's my opinion. 16:06:10

16 Q Right. So I guess not to be -- put too 16:06:11
17 fine a point on it, but you don't offer an opinion 16:06:15
18 that the claims -- claims 11 and 12 of '362 patent 16:06:18
19 are obvious when combining Zhang with Li, correct? 16:06:23

20 A I think Li -- Li was used -- and if you'll 16:06:46
21 look at the last sentence in 393, Li was used as 16:06:52
22 support to, quote/unquote, and I quote from my 16:06:56
23 report, confirms my understanding that Zhang's 16:06:58
24 frequency block converter are mixers or mixer 16:07:01
25 modules within the meaning of the '362 patent. 16:07:05

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1 That's how Li was used. 16:07:08

2 Q Right. You're not offering an opinion that 16:07:16
3 one of ordinary skill-in-the-art would combine Zhang 16:07:18
4 and Li to find that the '362 claims 11 and 12 are 16:07:22
5 obvious, right? 16:07:26

6 A I don't think that's anywhere in my report. 16:07:27

7 I said how I used Li. Li confirms my understanding. 16:07:30

8 Q Okay. Thank you. If you could look at 16:07:42
9 paragraph 389. I think we already talked about this 16:07:44
10 a little bit. And there there's the reference that 16:07:47
11 you talked about, the undesired -- we talked earlier 16:07:51
12 about undesired channels; do you remember that? 16:07:52

13 A We did. 16:07:55

14 Q Right. Can you explain to me in there 16:07:58
15 where it is that Zhang discloses undesired channels 16:08:01
16 explicitly? 16:08:05

17 A Sure. In 389 it says selects one or 16:08:07
18 more -- this is the quote from Zhang. Selects one 16:08:28
19 or more of the RF channels, D1 to DM, from one or 16:08:34
20 more of the digital RF channels, C1 through CN. So 16:08:38
21 there's a larger grouping and a smaller grouping and 16:08:47
22 there's a selection process. 16:08:50

23 Q Yeah. But why does that explicitly mean 16:08:55
24 that they are undesired channels? How does that 16:08:57
25 follow? 16:09:01